Space Weather Forecast

Issued on Saturday, 14 May 2022 at 01:03 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: R1-R2 radio blackouts likely. Chance (30%) of Minor geomagnetic storm on day 3 (16th).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, although multiple low to high C-class flares were observed throughout the period. These originated from different regions and were occasionally associated to CMEs (Coronal Mass Ejections), which were apparent in satellite imagery. Whilst we are awaiting results from analysis, they are not considered to be Earth directed. There are currently six sunspot regions on the visible disc. The largest and most complex region remains the one near the central meridian in the southern hemisphere but a new sunspot region has emerged in the northeast limb. It is currently not large but could become more complex and potentially active as further sunspots continue to emerge. All other regions are relatively weak and stable.

Solar Wind / Geomagnetic Activity: The solar wind speed as measured by DSCOVR at L1 has been slow, around 330-360 km/s. The total interplanetary magnetic field strength was weak and so was its important north-south component, though it remained largely negative. Resultant geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: No solar radiation storms have been observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low, though likely to become Moderate and accompanied by R1 or R2 radio blackouts at times.

Solar Wind / Geomagnetic Activity: Solar winds are expected to remain slow-ambient initially, along with a largely Quiet geomagnetic activity. However a coronal hole high speed stream is expected to connect with the Earth on day 3 (16th), with winds becoming elevated on days 3 and 4. This may enhance geomagnetic activity with Unsettled to Active periods on days 3 & 4 (16th and 17th), with a chance of a G1 / Minor Storm at the onset of the high speed stream (day 3 - 16th).

Energetic Particles / Solar Radiation: Solar radiation (high energy protons) are currently not expected to exceed thresholds over the next 4 days, although there is an ongoing slight risk.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	30	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	40	50	50
Very Active	R3 to R5 X	No	5	5	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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